Introduction to Horticulture

Curriculum Content Frameworks

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Curriculum Content Framework
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Grade Level: 10,11,12	**Semester**	**Prerequisites: None** **Course Code: 491280**

Course Description: This is an introductory course for students with a strong interest in horticulture. Careers in the industry are covered as well as basic plant systems and pest control. The student will be introduced to the areas of greenhouse management, nursery management, and landscaping.

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Unit 1: Introduction to Horticultural Science

Terminology: CDE, entrepreneur, floriculture, horticulture, interiorscaping, landscaping, olericulture, ornamental horticulture, placement, pomology, proficiency, SAE

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
1.1 Define horticulture terms		Foundation	Reading	Adjusts reading strategy to purpose and type of reading (skimming and scanning) [1.3.1]
		Interpersonal	Leadership	Comprehends ideas and concepts related to horticulture [2.4.2]
1.2 List the major areas of the horticulture industry		Foundation	Speaking	Speaks in a clear, concise manner [1.5.12]
		Thinking	Creative Thinking	Makes connections between seemingly unrelated ideas [4.1.6]
1.3 Identify careers in the horticulture industry	1.3.1 Research a career in the horticultural industry to determine education requirements, working conditions, and salary	Foundation	Writing	Takes notes from various sources {1.6.18]; uses language, style, organization, and format appropriate to subject matter, purpose, and audience [1.6.19]
		Personal Management	Career Awareness, Development, and Mobility	Develops skills to locate, evaluate, and interpret career information [3.1.3]; explores career opportunities [3.1.5]; identifies education and training needed to achieve goals [3.1.7]
1.4 Discuss FFA activities available to students in horticulture		Foundation	Speaking	Participates in conversation, discussion, and group presentations {1.5.8]; responds to listener feedback [1.5.10]
		Personal Management	Career Awareness, Development, and Mobility	Sets well defined and realistic personal/career goals (short term and long term) [1.3.10]

Unit 2: Plant Science

Terminology: anther, fertilization, filament, flower, fruit, leaf, ovary, photosynthesis, pistil, pollination, root, stamen, stem, stigma, style

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
2.1 Define plant science terms		Foundation	Reading	Applies information to new situations [1.3.5]
		Interpersonal	Leadership	Comprehends ideas and concepts related to fertilization [2.4.2]
2.2 List the four basic parts of a plant	2.2.1 Label the basic parts of a plant	Foundation	Writing	Adapts notes to a proper form [1.6.1]
		Interpersonal	Coaching	Helps others learn new skills [2.1.3]
2.3 Describe the function of roots		Foundation	Science	Describes/Explains scientific principles related to plant science [1.4.14]
		Thinking	Reasoning	Develops visual aids to create audience interest [1.4.1]; sees relationship between two or more ideas or situations [4.5.5]
2.4 Discuss the function of leaves		Foundation	Listening	Comprehends ideas and concepts related to plant science [1.2.1]
		Personal Management	Responsibility	Comprehends ideas and concepts related to leaves of plants [3.4.2]
2.5 Explain the function of stems		Foundation	Reading	Adjusts reading strategy to purpose and type of reading (skimming and scanning) [1.3.1]
		Interpersonal	Teamwork	Comprehends ideas and concepts related to the functions of stems on various plants [2.6.1]
2.6 Describe the function of flowers and fruit		Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7]
		Interpersonal	Coaching	Comprehends ideas and concepts related to the functions of flowers and fruit [2.1.1]

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
2.7 Explain the photosynthesis process	2.6.1 Diagram the chemical equation for photosynthesis	Foundation Thinking	Speaking Creative Thinking	Applies/Uses technical terms as appropriate to audience [1.5.2] Combines ideas or information in new way [4.1.2]
2.8 List the female reproductive parts of a flower		Foundation Thinking	Science Seeing things in the Mind's Eye	Chooses appropriately from a variety of scientific methods and techniques to complete a task [1.4.9] Organizes and processes images—symbols, pictures, graphs, objects, etc. [4.6.2]
2.9 List the male reproductive parts of a flower	2.9.1 Label the parts of a complete flower	Foundation Interpersonal Management	Writing Responsibility	Uses technical words and symbols [1.6.20] Comprehends ideas and concepts related to the parts of a flower [3.4.2]
2.10 Differentiate between pollination and fertilization		Foundation Personal Management	Listening Career Awareness, Development, and Mobility	Listens for content Comprehends ideas and concepts related to pollination [3.1.3]

Unit 3: Plant Growth

Terminology: clay, complete fertilizer, hormones, nitrogen, organic matter, peat moss, perlite, pH, phosphorus, potassium, retardants, sand, silt, vermiculite

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
3.1 List the three basic mineral soil particles		Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
		Thinking	Creative Thinking	Develops visual aids to create audience interest [4.1.4]
3.2 Define organic matter		Foundation	Science	Analyzes environmental issues (ecology, pollution, waste management)
		Thinking	Creative Thinking	Forms opinion [4.1.7]
3.3 List the three primary elements of a complete fertilizer	3.3.1 Analyze the label from a bag of complete fertilizer to determine its contents	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]
		Thinking	Decision Making	Comprehends ideas and concepts related to fertilizer [4.2.2]
3.4 Define soil pH		Foundation	Listening	Listens for content [1.2.3]
		Thinking	Knowing how to Learn	Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]
3.5 List the environmental factors that affect plant growth		Foundation	Reading	Draws conclusions from what is read [1.3.12]
		Personal Management	Responsibility	Comprehends ideas and concepts related to environmental factors of plant growth [1.3.12]
3.6 List the importance of hormones		Foundation	Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		Interpersonal	Teamwork	Comprehends ideas and concepts related to the importance of hormones [2.6.1]

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
3.7 Explain the importance of retardants		Foundation Thinking	Speaking Creative Thinking	Applies/Uses technical terms as appropriate to audience [1.5.2] Forms opinions [4.1.7]
3.8 Identify three components of soil-less media		Thinking Foundation	Seeing Things in the Mind's Eye Speaking	Visualizes a finished product [4.6.2] Pronounces words correctly

Unit 4: Plant Propagation

Terminology: asexual, propagation, sexual, vegetative

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
4.1 Define propagation terms		Foundation	Reading	Adjusts a reading strategy to purpose and type of reading (skimming and scanning) [1.3.1]
		Personal Management	Responsibility	Comprehends ideas and concepts related to propagation [3.4.2]
4.2 List the two types of propagation		Foundation	Science	Acquires and processes scientific data [1.4.1]
		Thinking	Knowing how to Learn	Uses available resources to apply new skills [4.3.6]
4.3 Compare and contrast sexual propagation and asexual propagation	4.3.1 Propagate plants using sexual propagation methods	Foundation	Writing	Adapts notes to a proper form [1.6.1]
		Thinking	Creative Thinking	Makes connection between seemingly unrelated ideas
	4.3.2 Propagate plants using asexual propagation	Foundation	Science	Acquires and processes scientific data [1.4.1]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations

Unit 5: Pest Control

Terminology: fungicide, herbicide, insecticide, IPM (integrated pest management), LD, miticide, molluscicide, nematocide, pest, pesticide, rodenticide, signal words

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
5.1 Define pest control terms		Foundation	Reading	Analyzes and applies what has been read to specific task [1.3.2]
		Thinking	Creative Thinking	Combines ideas or information in a new way [4.1.2]
5.2 Classify pesticides according to the pest controlled		Foundation	Listening	Listens for long-term context [1.2.7]
		Thinking	Problem Solving	Comprehends ides and concepts related to pesticides [4.4.1]
5.3 Read and interpret chemical labels		Foundation	Science	Follows safety guidelines [1.4.16]
		Personal Management	Integrity/ Honesty/Work Ethic	Chooses ethical course of action [3.2.1]
5.4 Identify and interpret the four signal words on chemical labels		Foundation	Writing	Uses technical words and symbols [1.6.20]
		Personal Management	Responsibility	Comprehends ideas and concepts related to pest control [3.4.2]
5.5 Identify the basic protective equipment needed to apply pesticides		Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7]
		Interpersonal	Coaching	Encourages others to develop personal and professional skills [2.1.2]
5.6 Discuss the benefits of integrated pest management		Foundation	Science	Analyzes environmental issues (ecology, pollution, waste management) [1.4.2]
		Thinking	Decision Making	Identifies pros and cons to assist in decision-making process [4.2.7]

Unit 6: Container-grown Plants

Terminology: container-grown, field-grown, interiorscaping

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
6.1 Identify the importance of interiorscaping	6.1.1 Visit malls, restaurants, hotels, or other locations with large number of plants to observe the impact of plants on the interior landscape	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5] Prepares presentation based on subject research, interviews, and surveys [4.1.10]
6.2 Compare and contrast container-grown plants and field-grown plants	6.2.1 Discuss water and fertilizer requirements for container-grown shrubs and trees	Thinking	Decision Making	Evaluates information/data to make best decision [4.2.5] Identifies relevant details, facts, and specifications [1.3.16]
6.3 Explain the advantages and disadvantages of plastic, ceramic, terra cotta, and glass pots		Interpersonal Thinking	Customer Service Problem Solving	Demonstrates face-to-face selling skills [2.3.3] Demonstrates logical reasoning in reaching a conclusion [4.4.2]

Unit 7: Using Plants in the Landscape

Terminology: annual, biennial, deciduous, evergreen, herbaceous, perennial, woody

CAREER and TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
7.1 Define terms		Foundation	Reading	Uses written resources (books, dictionaries, directories) to obtain factual information [1.3.23]
		Thinking	Knowing How to Learn	Develops personal learning strategies—notetaking, clustering related items, flash cards, etc. [4.2.3]
7.2 Differentiate between herbaceous and woody plants	7.2.1 Discuss the advantages of using perennials in a landscape	Thinking	Decision Making	Comprehends ideas and concepts related to herbaceous and woody plants [4.2.2]
7.3 Differentiate between deciduous and evergreen		Foundation	Listening	Receives/interprets verbal messages [1.2.8]
		Thinking	Creative Thinking	Combines ideas or information in a new way [4.1.2]
7.4 Discuss deciduous vs. evergreen as used in a landscape	7.4.1 Evaluate a landscape in the community	Foundation	Reading	Interprets drawings to obtain factual information [1.3.17]; uses appropriate materials and techniques as specified [1.3.20]
		Personal Management	Responsibility	Exhibits enthusiasm in approaching and completing tasks [3.4.3]

Unit 1: Introduction to Horticultural Science

1. CDE—Career Development Event
2. Entrepreneur—one who works for oneself
3. Floriculture—the science and practice of growing, harvesting, storing, designing, marketing, and distributing foliage and/or flowering plants
4. Horticulture—literally means "garden cultivation"; includes the cultivation, processing, and sale of fruits, nuts, vegetables, ornamental plants, and flowers
5. Interiorscaping—using live plants to landscape indoor areas; also known as plantscaping
6. Landscaping—the science and practice of installing, maintaining, and using grasses, plants, shrubs, and trees in the landscape
7. Olericulture—the science and practice of growing, harvesting, storing, processing, and marketing vegetables
8. Ornamental horticulture—the practice of growing and using plants for decorative purposes
9. Placement—working for someone else
10. Pomology—the science and practice of growing, harvesting, handling, storing, processing, and marketing tree fruits
11. Proficiency—an award for an individual's SAE
12. SAE—Supervised Agricultural Experience

Unit 2: Plant Science

1. Anther—a sac-like structure at the top of the stamen that contains pollen
2. Fertilization—the fusion or joining of a sperm with an egg
3. Filament—the stalk-like part of the stamen that holds the anther
4. Flower—the reproductive organs of a plant
5. Fruit—the reproductive body of a seed plant consisting of one or more seeds and usually various protective and supporting structures
6. Leaf—an outgrowth from a plant that constitutes part of the foliage and functions primarily in food manufacture by photosynthesis
7. Ovary—the lower part of the pistil that contains one or more ovules or the part in which the eggs are produced and seeds develop
8. Photosynthesis—the manufacture of food by green plants in which carbon dioxide and water are combined in the presence of light and chlorophyll to form sugar and oxygen
9. Pistil—the female reproductive parts of a flower
10. Pollination—the transfer of pollen from the anther to the stigma of the flower
11. Root—the lower portion of a plant that bears neither leaves nor reproductive organs and that mostly develops underground and anchors the plant; the hairs absorb water and mineral nutrients
12. Stamen—the male reproductive parts of a flower
13. Stem—stalk, trunk, or branch of a plant; can be vertical or horizontal
14. Stigma—structure found at the top end of the pistil that contains a sticky surface on which pollen can be caught
15. Style—the tube in the pistil that leads from the stigma to the ovary and through which pollen reaches the ova and egg

Unit 3: Plant Growth

1. Clay—fine-grained soil; smallest soil particle
2. Complete fertilizer—contains all three of the primary fertilizer nutrients (nitrogen, phosphorus, and potash)
3. Hormones—chemical messenger substance that affects plant growth
4. Nitrogen—odorless, colorless nutrient needed for plant life
5. Organic matter—decayed remains of plants and animals
6. Peat moss—moss plants that grow on heath bogs
7. Perlite—heat-treated lava rock that is light weight with low moisture and nutrient-holding capacity
8. pH—an index of the acidity of a substance
9. Phosphorus—a soft, nonmetallic element
10. Potassium—a bluish-white, highly reactive, metallic element
11. Retardants—slow down a process
12. Sand—largest soil particle; hard, granular rock; finer than gravel and coarser than dust
13. Silt—fine particles of soil; smaller than sand and larger than clay
14. Vermiculite—heat-treated mica that is light weight with nutrient and moisture-holding capacity

Unit 4: Plant Propagation

1. Asexual—without the union of male and female sex cells (also referred to as vegetative)
2. Propagation—the reproduction of plants by seed, cuttings, budding, or grafting to increase in number, to reproduce
3. Sexual—reproduction involving the male and female sex cells (pollen and egg)
4. Vegetative—type of reproduction using plant parts (but not the reproductive parts)

Unit 5: Pest Control

1. Fungicide—a substance used to control undesirable fungi
2. Herbicide—material used to control undesirable plants
3. Insecticide—material used to control insects
4. IPM (integrated pest management)—a variety of control methods, such as cultural, mechanical, biological and chemical, used together to control pests
5. LD—Lethal dose
6. Miticide—material used to control mites
7. Molluscicide—a chemical used to kill snails and slugs
8. Nematocide—material used to control nematocides
9. Pest—anything unwanted
10. Pesticide—material used to kill or repel pests
11. Rodenticide—a substance used to control rodents
12. Signal words—words on a pesticide label used to alert the user to the toxicity of a pesticide (danger, caution, warning, poison)

Unit 6: Container-grown Plants

1. Container-grown—plants that are grown in manmade containers, such as clay or plastic pots or hanging baskets

2. Field-grown—plants grown in normal soil in the ground

3. Interiorscaping—using indoor plants (also commonly referred to as "houseplants") to decorate or improve aesthetics inside a home or commercial building

Unit 7: Using Plants in the Landscape

1. Annual—a plant that completes its life cycle in one year
2. Biennial—a plant that completes its life cycle in two seasons
3. Deciduous—a plant that loses its leaves during winter
4. Evergreen—a plant that retains its foliage during winter
5. Herbaceous—a plant with a soft or succulent stem
6. Perennial—a plant that lives for more than two seasons
7. Woody—plants such as shrubs, trees, and some vines that have a wood or hard-texture stem and have above-ground buds that survive through winter